



AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

COMMITTEE CORRESPONDENCE

February 9, 2000

Dear Mr. Bass:

The Long Term Pavement Performance Program (LTPP) was initiated as a part of the Strategic Highway Research Program in 1987. The intent was a 20-year study of pavements that would provide the highway community with the information it needed to design, build and maintain cost-effective and long lived pavements. Alabama is one of 37 states and provinces participating in the LTPP Specific Pavement Studies (SPS). A core objective of these studies is to quantify relationships between pavement performance and truck volumes and axle loadings. It is essential to quantify these relationships if we are to make progress in improving our ability to predict the long-term performance of our Interstates and other major highways. Unfortunately, the states and provinces have fallen behind in collecting the required traffic data and successful achievement of this goal is in serious jeopardy. After a recent review, the Transportation Research Board's LTPP Committee, which oversees the program on behalf of the states and provinces, has concluded that current traffic data collection by the states and provinces is proving inadequate to maintain effective SPS experiments. If the data shortfall is not corrected immediately, we will lose the opportunity to understand and quantify the relationship between truck loadings and pavement performance. As Chairman of SCOH's Task Force on SHRP Implementation, it is my job to convey the TRB Committee's recommendations and solicit your feedback in preparation for the SCOH meeting in St. George, Utah on April 7th, 2000.

Attachment 1 shows the location of the SPS test sites throughout the US and Canada. The legend on this attachment relates the names and shorthand number for each of the experiments. Attachment 2 provides a history of traffic data collection at each of the test sites. I urge you to look at this table carefully. It clearly illustrates that the problem is not confined to a few states or experiments. You can also see that even for individual test sites, data collection is often erratic.

In agreeing to build the SPS project(s) Alabama, and the other participating states and provinces, committed to collect traffic data using weigh-in-motion (WIM) and automatic vehicle counting and classification (AVC) equipment. As is obvious from the table, the collective response has been poor and the TRB LTPP Committee's conclusion is justified.

The LTPP Committee is not simply pointing fingers, however. The committee members, a majority of whom are from state and provincial DOTs, have analyzed the situation in depth and have delivered to AASHTO a series of recommendations to correct the problem. As chair of the AASHTO Task Force on SHRP Implementation, I am forwarding a summary of the committee's analysis and recommended solution for your consideration (Attachment 3). A copy of the entire document is available by contacting Robert Raab of TRB by email at rraab@nas.edu or by fax at (202) 334-3471.

The recommendations propose major changes in the SPS traffic data collection effort. These changes will require uniform national standards for the acquisition, installation, calibration, and operation of WIM/AVC equipment, as well as the timely processing of the resulting data. The goal is to produce five full years of quality traffic data for each SPS test site. Where feasible, states can certify that the truck loadings on SPS-8 sites do not exceed the study maximum. This study looks at environmental factors affecting performance, so focus on highways with low truck volumes. This will ease the data collection burden on some states.

The total estimated cost of implementing the recommendations through FY 2003 is \$10 million. The estimated costs for Alabama SPS project(s) are shown in attachment 4. The TRB LTPP Committee recommends that some of these functions be completed on a centralized LTPP-wide basis to improve efficiency, while other must remain the responsibility of the individual states and provinces. Attachment 4 provides a break down of the estimated costs by function.

The urgency and the importance of the SPS experiments require AASHTO to respond to the TRB-LTPP Committee's recommendations. We have requested that this subject be included for discussion at the next AASHTO-SCOH meeting in April. If that discussion is to be useful, we need to gather all the facts we can from the states and provinces participating in the SPS experiments. To facilitate a discussion at the SCOH meeting, we would appreciate receiving your response by March 15. If you and your staff have any questions or need additional clarification about the impact of proposed solution on traffic data collection at your SPS test sites, please contact Mr. Charles Churilla at (202) 493-3142.

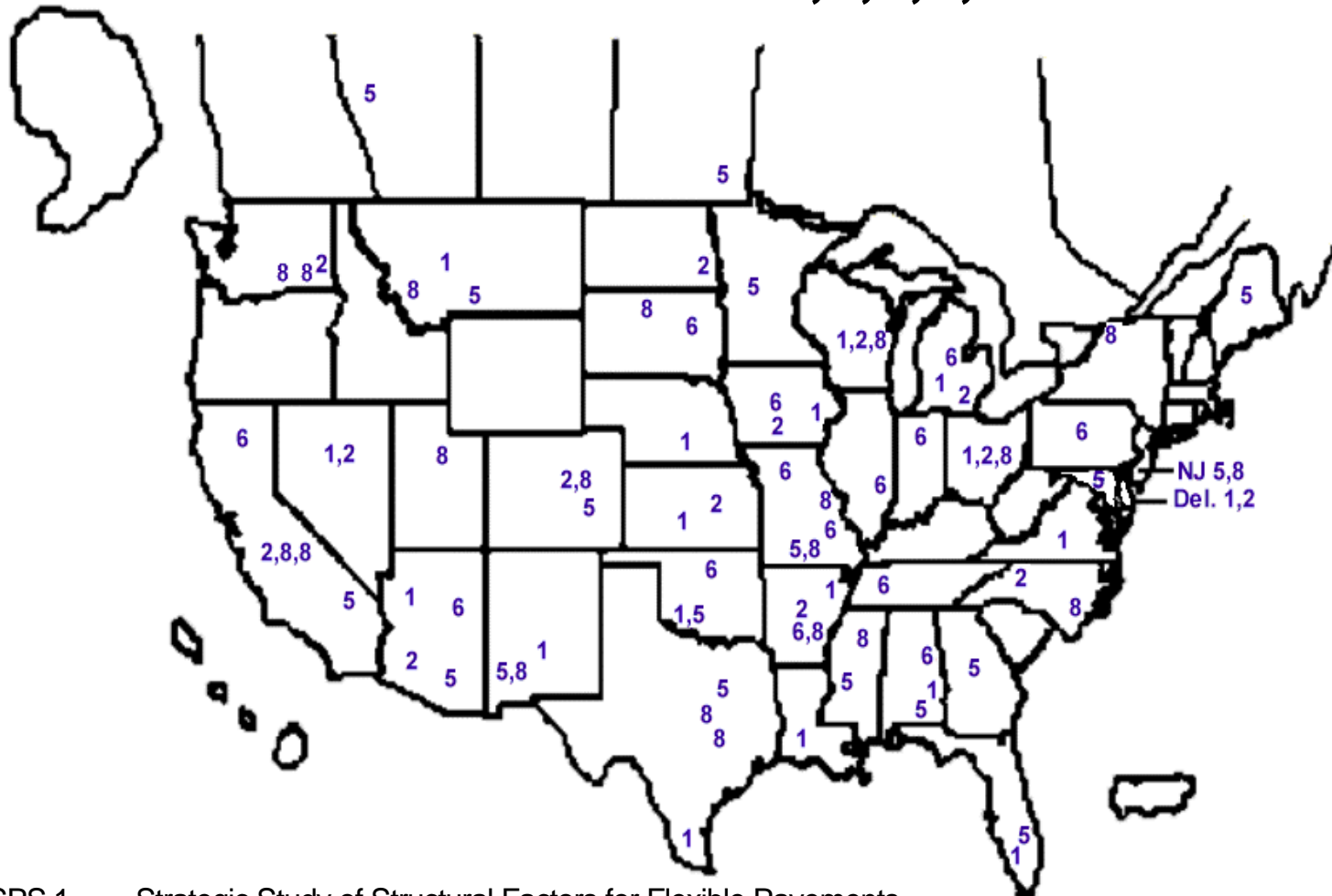
Sincerely,

John F. Conrad, Chair
AASHTO Task Force on SHRP Implementation

Enclosures

cc: Non-SPS States, with attachments 1, 2 and 3
Allan Abbott, TRB LTPP Committee
AASHTO SHRP Task Force
Vincent F. Schimmoller, FHWA
Charles Churilla, FHWA
Haleem Tahir, AASHTO
Sarah Wells, C-SHRP
Robert Raab, TRB

SPS EXPERIMENTS 1,2,5,6, AND 8



- SPS 1 Strategic Study of Structural Factors for Flexible Pavements
- SPS 2 Strategic Study of Structural factors for Rigid Pavements
- SPS 5 Rehabilitation of Flexible Pavements
- SPS 6 Rehabilitation of Jointed Portland Cement Concrete Pavements
- SPS 8 Study of Environmental Effects in the Absence of Heavy Loads

ATTACHMENT 1

Days of Monitored Traffic Data for SPS 1 - Strategic Study of Structural Factors for Flexible Pavements																		
State	AL	AR	AZ	DE	FL	IA	KS	LA	MI	OH	MT	NE	NM	OK	NV	TX	VA	WI
Construction	03/93	11/93	10/92	08/95	11/94	11/92	10/93	05/96	11/95	09/96	-	08/95	11/95	04/97	08/95	08/97	08/95	09/97
Out of Study ¹								12/99										
1993	WIM ²	-	-	0	-	-	35	20	-	-	-	-	-	-	-	-	-	-
	Class ³	-	-	0	-	-	8	18	-	-	-	-	-	-	-	-	-	-
1994	WIM	0	0	354	-	-	23	212	-	-	-	-	-	-	-	-	-	-
	Class	0	0	352	-	-	1	212	-	-	-	-	-	-	-	-	-	-
1995	WIM	0	40	344	-	0	Y	0	-	-	-	-	-	-	-	-	-	-
	Class	0	89	340	-	0	Y	0	-	-	-	-	-	-	-	-	-	-
1996	WIM	0	89	341	0	104	50	0	0	191	-	-	242	0	-	331	-	0
	Class	0	89	341	0	104	40	0	0	179	-	-	241	0	-	354	-	0
1997	WIM	0	0	184	0	238	0	0	0	59	-	-	289	0	-	339	-	313
	Class	0	0	182	0	242	0	0	0	345	-	-	340	0	-	324	-	312
1998	WIM ⁴	0	215	365	0	221	Y	0	0	0	273	-	0	50	0	Y	0	257
	Class ⁴	0	93	329	0	242	0	0	0	360	258	-	0	98	0	Y	0	249

Days of Monitored Traffic Data for SPS 2 - Strategic Study of Structural factors for Rigid Pavements															
State		AR	AZ	CA	CO	DE	IA	KS	MI	NC	ND	NV	OH	WA	WI
Construction		10-95	02/93	-	01/93	05/95	11/94	08/92	11/93	09/93	10/94	08/95	09/96	11/95	09/97
Out of Study ¹															
1992	WIM ²	-	-	-	-	-	-	79	-	-	-	-	-	-	-
	Class ³	-	-	-	-	-	-	191	-	-	-	-	-	-	-
1993	WIM	-	0	-	-	-	-	50	47	-	-	-	-	-	-
	Class	-	0	-	-	-	-	78	5	-	-	-	-	-	-
1994	WIM	-	147	-	0	-	-	6	344	62	-	-	-	-	-
	Class	-	123	-	0	-	-	107	135	62	-	-	-	-	-
1995	WIM	-	44	-	229	-	0	0	0	149	-	-	-	-	-
	Class	-	44	-	227	-	0	0	225	149	-	-	-	-	-
1996	WIM	0	180	-	351	0	0	0	318	340	Y	331	-	0	-
	Class	81	140	-	344	0	171	0	317	341	0	354	-	0	-
1997	WIM	0	0	-	361	0	116	0	149	147	Y	339	-	28	Y
	Class	0	0	-	360	0	96	0	140	149	0	342	-	30	Y
1998	WIM ⁴	0	0	-	0	0	Y	0	299	85	Y	Y	271	199	Y
	Class ⁴	0	44	-	0	0	Y	0	286	90	0	Y	288	198	Y

1 Out of Study = Traffic data not required after this date

2 WIM = Weigh in Motion

3 AVC = Automatic Vehicle Classification

4 Y indicates that data has been received, but has not been processed for upload to the database.

Days of Monitored Traffic Data for SPS 5 - Rehabilitation of Flexible Pavements																		
State, Province	AB	AL	AZ	CA	CO	FL	GA	MB	MD	ME	MN	MO	MS	MT	NJ	NM	OK	TX
Construction	11/90	12/91	04/90	02/92	01/87	04/95	06/93	05/89	04/92	05/95	10/90	10/99	09/90	09/91	07/92	09/96	07/97	10/91
Out of Study ¹	-	-	-	-	-	-	-	-	-	-	-	-	1999	-	-	-	-	-
1990	WIM ²	0	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	0
	Class ³	0	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	0
1991	WIM	0	-	0	-	0	-	-	0	-	-	0	-	0	0	-	-	-
	Class	0	-	0	-	0	-	-	45	-	-	8	-	0	0	-	-	51
1992	WIM	0	0	0	-	0	-	-	0	-	-	349	-	150	0	-	-	0
	Class	0	0	0	-	0	-	-	239	-	-	358	-	10	273	-	-	52
1993	WIM	0	0	31	0	123	-	-	0	0	-	347	-	350	0	219	-	0
	Class	0	0	79	0	133	-	-	12	0	-	345	-	350	0	215	-	39
1994	WIM	0	0	0	0	365	-	0	119	155	-	353	-	90	0	321	-	0
	Class	0	0	155	0	364	-	0	3	154	-	357	-	90	35	315	-	74
1995	WIM	0	0	0	0	0	-	0	0	0	-	119	-	345	0	360	-	-
	Class	0	0	0	0	203	-	0	0	1	-	119	-	345	316	351	-	45
1996	WIM	0	0	0	0	336	28	0	0	0	0	0	-	100	0	302	-	7
	Class	0	0	0	0	0	0	0	0	63	0	0	-	100	0	282	-	54
1997	WIM	0	0	117	0	357	21	0	0	0	0	0	-	0	0	263	0	0
	Class	0	0	85	32	364	0	0	0	0	0	0	-	0	2	207	0	60
1998	WIM ⁴	0	0	142	Y	0	0	0	0	0	0	0	-	0	0	25	8	254
	Class ⁴	0	0	90	0	0	0	0	0	0	0	0	-	0	0	23	14	233

1 Out of Study = Traffic data not required after this date

2 WIM = Weigh in Motion

3 AVC = Automatic Vehicle Classification

4 Y indicates that data has been received, but has not been processed for upload to the database.

Days of Monitored Traffic Data for SPS 6 - Rehabilitation of Jointed Portland Cement Concrete Pavements														
State	AL	AR	AZ	CA	IA	IL	IN	MI	MO	MO	OK	PA	SD	TN
Construction	06/98	01/97	06/90	05/92	09/89	11/90	08/90	05/90	9/99	08/92	08/92	09/92	09/92	04/96
Out of Study ¹	-	-	-	-	-	-	-	2000	-	-	-	-	-	-
1990	WIM ²	-	-	0	-	-	-	-	-	0	-	-	-	-
	Class ³	-	-	0	-	-	-	-	-	4	-	-	-	-
1991	WIM	-	-	0	-	-	16	31	12	-	0	-	-	-
	Class	-	-	0	-	-	0	31	0	-	4	-	-	-
1992	WIM	-	-	0	-	-	1	190	137	-	0	-	-	87
	Class	-	-	0	-	-	1	323	0	-	0	-	-	143
1993	WIM	-	-	0	1	-	46	59	341	-	119	0	4	202
	Class	-	-	0	0	-	44	114	184	-	119	30	4	295
1994	WIM	-	-	178	0	29	122	205	248	-	49	0	0	58
	Class	-	-	160	0	36	100	302	248	-	218	0	0	85
1995	WIM	-	-	339	99	59	0	10	291	-	321	222	4	0
	Class	-	-	336	141	43	60	141	345	-	235	223	4	0
1996	WIM	-	-	326	166	132	36	72	212	-	319	38	0	0
	Class	-	-	313	150	132	25	178	332	-	361	39	0	0
1997	WIM	-	0	19	168	199	49	236	364	-	246	0	0	146
	Class	-	0	0	168	47	292	360	361	-	241	0	0	144
1998	WIM ⁴	0	0	44	Y	Y	304	180	364	-	209	0	0	0
	Class ⁴	0	0	7	Y	Y	327	359	359	-	323	0	0	0

1 Out of Study = Traffic data not required after this date

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3 AVC = Automatic Vehicle Classification

4 Y indicates that data has been received, but has not been processed for upload to the database.

LTPP Specific Pavement Studies (SPS) Traffic Data Collection
Summary of TRB LTPP Committee Findings and Recommendations

The SPS Traffic Data Collection Problem

- Traffic data is critical to the understanding of how and why pavements perform
- Nearly 10 years of SPS traffic data collection has yielded incomplete and inconsistent data
- Based on past performance, 50% or more of the SPS 1, 2, 5, and 6 test sites will not have adequate quantity and quality of traffic data
- Data collection problems are not identified and too much data is lost because of lengthy delays in submission for processing
- If uncorrected, LTPP will fall far short of developing the improved pavement designs and technology that the states requested and need.

Recommended SPS Traffic Data Collection Plan

In order to achieve at least five-full years of traffic data on the SPS projects the following steps are recommended:

- Apply common WIM/AVC standards all SPS sites requiring traffic loading data
- WIM and AVC equipment type
- Installation procedures
- Pavement structure and smoothness requirements
- Initial and periodic calibration procedures
- Equipment maintenance
- Pavement maintenance
- Waivers may be granted if data collection at a specific site is meeting study needs
- Centralize equipment purchases, installation, calibration and maintenance
- Improve timeliness and quality of traffic data processing
- Timely traffic data submission and processing, weekly or bi-weekly
- Consistent evaluation of traffic data
- Identify and correct problems quickly
- Centralize routine SPS traffic data collection and processing with LTPP research team
- Accept SPS-8 traffic loading data on agency certification

SPS Traffic Plan Tasks and Roles

	Current	Recommended
· Define WIM/AVC specifications and guidelines	None	LTPP
· Equipment purchase	State	Centralize
· Installation of equipment and calibration	State	Centralize
· Periodic calibration checks	State	Centralize
· Equipment maintenance	State	Centralize
· Data collection and submission	State	LTPP
· Data processing and management	LTPP	LTPP
· Pavement construction and maintenance	State	State
·		

Cost Impacts of the SPS Traffic Data Collection Plan

- Total estimated cost for FY 2000-2010 is \$20 Million
- Total cost for FY 2000-2003 is \$10.2 Million

State Name	SPS			
National Program	1	5	6	Totals
Item 1	33,800	33,800	33,800	101,400
Item 2	18,350	18,350	18,350	55,050
Item 3	56,650	56,650	56,650	169,950
Subtotal National Program	108,800	108,800	108,800	326,400
State Responsibility				
Item 4	x	x	x	x

“x” refer to the hard copy of the February 9 letter or the February 17 email from Mr. Judycki for the actual dollar estimates

Item 1 is equipment purchase, installation, initial calibration, and equipment maintenance:

- All piezo systems and any bending plate system expected to fail before 2006 are costed as an equipment expenditure in 2001-2003.
- All systems being purchased are bending plate.
- A fixed cost has been used for installation.
- Total estimated equipment maintenance cost has been prorated over WIM systems only.
- The calibration visit is assumed to be a single loop done solely for that site.

Item 2 is annual site visits for calibration and smoothness checks:

- The smoothness check cost is considered a minor increment to a previously scheduled visit.
- The calibration checks have the costs of the extra visits for the expected 20% failure rate prorated across all WIM sites.
- The annual visit at a SPS-8 site is a calibration rather than a calibration check. There is no calibration check visit for an SPS-8.
- The calibration checks are assumed to be on a two per week schedule.

Item 3 is data processing, traffic data QA and traffic program administration.:

- Data processing for a WIM site is a fixed cost.
- A single fixed cost was assigned for communications for all sites.
- Data processing for a classification site is a fixed cost.
- QA and administration is prorated across WIM locations.

Item 4 is pavement construction costs:

- All SPS-1 sites were assumed to need PCC slabs.
- SPS-2 sites were costed conservatively assuming that slab replacement would be required if the site did not meet spec. It is thought to be cheaper to remove the equipment and replace the necessary slabs rather than tinkering with grinding etc. as corrective actions. While this may not require a full length replacement, that cost is the upper limit on the estimate. The cost for removing WIM equipment is not known, nor is how much of the in ground equipment could be reused.
- All SPS-5 sites were assumed to need PCC slabs.
- All SPS-6 sites were assumed to need PCC slabs since the project is rehabilitation of PCC.